

Ethnicity and prehospital care for people with suspected cardiac pain: cross-sectional study

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Keywords: pain, analgesia, prehospital care, paramedic, Emergency Medical Services

Abstract: 257 words

Word count (excluding quotes and references): 2,565 (exc. title page, abstract, tables & figures, and references).

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Running title: Ethnic variations in prehospital care

AUTHORS' CONTRIBUTIONS

ANS conceived the original idea for the study. ZA conducted the statistical analysis.

All authors contributed to the design and conception of the paper. ZA wrote the first draft of the paper. All authors contributed to the discussion and final paper. ANS is guarantor for the study. There are no conflicts of interest.

ABSTRACT

Objectives

Few studies have investigated the quality of prehospital care by ethnicity. We aimed to investigate ethnic differences in prehospital ambulance care of patients with suspected cardiac pain.

Methods

We conducted a cross-sectional analysis of retrospective electronic clinical data for patients with suspected cardiac pain over one year (August 2011 to July 2012) extracted from a single regional ambulance service. This included patient demographic data, clinical measurements, drugs administered and outcomes, such as transportation to hospital or referral to primary care. We used multivariate regression to investigate differences in care by ethnicity comparing non-white with white patients.

Results

There were 7,046 patients with suspected cardiac pain, with 4,825 who had ethnicity recorded including 4,661 (96.6 per cent) white, 164 (3.4 per cent) non-white. After correcting for age, sex, socioeconomic status and whether transported to hospital, non-white patients were significantly more likely to have temperature (OR 2.96, $p=0.007$), blood glucose (OR 3.95, $p=0.003$), respiratory rate (OR 4.94, $p=0.03$) and oxygen saturation (OR 2.43, $p=0.006$) recorded. Non-white patients were significantly less likely to be transported to hospital (OR 0.43, $p=0.03$).

Conclusion

There were significant differences in prehospital ambulance care for non-white compared with white patients with suspected cardiac pain. These differences could be due to differences in clinical condition or case-mix, language and cultural barriers, limited understanding of appropriate use of healthcare services, recording bias, or true differences in provider management. Further analysis should involve larger and more complete datasets to explore ethnic differences in greater detail.

INTRODUCTION

Equity, irrespective of ethnicity, is a fundamental ethical principle for quality health care.[1] It has risen up the policy agenda in recent years as modern health services are required to respond to increasing ethnic diversity within the populations they serve. In the United Kingdom (UK), minority ethnic groups comprise eight million people or 14 per cent of the population and this proportion is growing.[2] A number of UK statutes over the past fifty years culminated in the Equality Act 2010, requiring public and voluntary bodies to eliminate discrimination and promote equality of opportunity in service delivery. The National Health Service (NHS), in response, has introduced guidance through its Equality Delivery System (EDS) to ensure compliance with the Equality Act 2010.[4, 5]

Minority ethnic groups have different patterns of illness in the UK, including higher rates of coronary heart disease (CHD) and type 2 diabetes in South Asians (patients from the Indian sub-continent)[6-9] as well as stroke in Black Caribbeans.[10] Although previous studies showed small and narrowing ethnic health disparities for cardiovascular diseases in primary[7, 11] or secondary care settings[8], few studies have focused on the quality of prehospital ambulance care for conditions including cardiovascular presentations in minority ethnic patients in the UK.

Some South Asian groups were more likely than white patients to seek immediate medical help for suspected cardiac pain.[12] Another study found that South Asians experiencing chest pain were less likely to arrive by ambulance.[13] This finding is reinforced by Smith *et al.*'s US study (2010) which found that Mexican-Americans

who had suffered a stroke were 40 per cent less likely to arrive by EMS than non-Hispanic whites.[14]

Some minority ethnic groups are more likely to delay or even refuse seeking treatment. In the US, Galea, *et al.* (2007)[15] found that two main reasons why African-Americans delayed seeking help for out-of-hospital cardiac arrests (OHCAs) – previous negative, usually discriminatory, experiences of healthcare professionals and limited symptom awareness. Delaying or refusing treatment can lead to poorer health outcomes, or excess morbidity and mortality.[15, 16]

Owing to limited research in this area, we aimed to investigate differences in prehospital ambulance care delivered to minority ethnic patients with suspected cardiac pain.

METHODS

We conducted a cross-sectional analysis of retrospective electronic clinical data extracted from a large single regional ambulance service for patients with suspected cardiac pain from August 2011 to July 2012.

Study population

This study included patients recorded as having suspected cardiac pain attended by East Midlands Ambulance Service NHS Trust (EMAS). EMAS answers emergency 999 calls providing urgent and emergency services for 4.4 million people in Derbyshire, Leicestershire, Rutland, Lincolnshire, Northamptonshire and Nottinghamshire (Table 2).[17] The East Midlands is a largely rural region in the UK, with the major cities being Leicester, Nottingham and Derby, each of which have populations in excess of 200,000. They are surrounded by many small market towns. The City of Leicester local authority area has the highest minority ethnic population in the East Midlands. According to the 2011 ONS Census, 37 per cent of its population of around 330,000 were Asian, up from 30 per cent in 2001.[18]

Data analysis

We accessed patient demographic data including ethnicity, age, sex, socioeconomic deprivation (as measured by Index of Multiple Deprivation [IMD]), and urban or rural place of residence. Clinical measurements usually undertaken for patients with suspected cardiac pain were extracted including rates of recording of blood pressure, respiratory rate, pain assessment, temperature, blood glucose, oxygen saturation and electrocardiogram. We considered rates of drugs administered by paramedics, including aspirin, nitroglycerin, Entonox and morphine for these patients. Finally, data on care outcomes, including rates of transportation to hospital (termed ‘see and convey’), treatment at home followed by discharge (‘see and treat’) or referral to primary care (‘see and refer’) were also analysed.

We also compared ambulance data for patients attended to by the ambulance service from August 2011 to July 2012 with Office for National Statistics (ONS) population estimates for East Midlands in 2012 to investigate differences between rates of presentation to the ambulance service compared with ethnicity in the resident population.[2] Ambulance service staff are required to record ethnicity data for patients under the Equality Act 2010.

We used multivariate regression to investigate differences in care by ethnicity comparing non-white with white patients adjusting for age, sex, socio-economic and urban/rural status. Analysis was conducted using Stata 12.[19]

RESULTS

There were 7,046 patients with suspected cardiac pain attended to by EMAS between August 2011 and July 2012. Of these, 4,825 had ethnicity recorded, of whom 96.6 per cent were white. Ethnicity data were missing for 2,221 (31.5 per cent) patients. Non-white patients were similar to white patients in relation to gender ($p=0.63$) and socio-economic status ($p=0.08$), but were significantly younger ($p<0.001$) (Table 1).

[Insert Table 1 here]

Of the 75 non-white patients for whom we had IMD data for, 74 (98.7 per cent) lived in less sparse urban areas. By contrast, the corresponding figure among the 1,569 white patients for whom we had such data, was 1,273 (81.1 per cent). The ONS population data for the East Midlands[17] by ethnicity showed that ambulance

services were proportionately more likely to attend white than non-white patients (Table 2).

[Insert Table 2 here]

Bivariate analysis comparing non-white to white patients showed a number of differences. Non-white patients were significantly more likely to have blood glucose (78.7 per cent vs. 69.4 per cent, $p=0.011$) and temperature recorded (77.4 per cent vs. 69.8 per cent, $p=0.035$) than white patients. For unadjusted drug administration, non-whites were only significantly more likely to receive aspirin than whites (14.0 per cent vs 8.7 per cent, $p=0.018$). There were no significant differences between non-white and white patients in those 'treated and discharged', 'referred to primary care', 'refused treatment', 'not treated', 'electrocardiogram (ECG) or cannulation performed. There were no significant differences in aspirin, nitroglycerin, Entonox or morphine administration, adjusting for age, sex, socio-economic status, urban/rural status, whether transported to hospital or treated and discharged (Table 3).

[Insert Table 3 here]

Additional multivariate logistic regression, adjusting for age, sex, socio-economic status, IMD, urban/rural status, whether transported to hospital or treated and discharged, showed that non-white patients were similar to white patients in recording of blood pressure, pain score, cannulation and ECG. However, non-whites were significantly more likely than whites to have their oxygen saturation (OR 2.43,

p=0.006), temperature (OR 2.96, p=0.007), respiratory rate (OR 4.94, p=0.03) and blood glucose (OR 3.95, p=0.003) recorded (Table 4).

[Insert Table 4 here]

A multivariate logistic regression adjusting for ethnicity, age, sex, socio-economic status and urban or rural status showed that non-whites were 57 per cent (p=0.03) less likely to be transported to hospital after adjusting for age, sex, IMD and Urban/Rural setting. Men with suspected cardiac pain were 76 per cent more likely to be transported to hospital than women (Table 5).

Insert Table 5 here

DISCUSSION

We found similarities in prehospital ambulance care for non-white compared with white patients with suspected cardiac pain. However, non-white patients were more likely to have a number of clinical assessments recorded and less likely to be transported to hospital. The finding that non-white patients were significantly more likely than white patients to have blood glucose recorded could be explained by higher levels of diabetes among the former .

Delaying or refusing medical treatment may increase the risk of preventable morbidity and mortality in conditions such as cardiac disease.[15, 20] In some minority ethnic groups, such delays or refusals can be due to a number of inter-related factors including, different cultural norms, perceived discrimination, language and

communication problems and limited knowledge of how and when to appropriately use healthcare services. Cultural norms and beliefs can influence health and help-seeking behaviour, for example, in some minority ethnic groups, it is not considered 'masculine' to seek help or express pain.[20, 21] There is also a greater reliance on the family to manage illness in some ethnic groups.[22] For example, the family is a key agency in seeking medical help [20, 23] in some South Asian families in the UK who are more likely to live in large households with an extended family network to call upon.[24]

Clinicians need to be aware of differences in how patients report their symptoms, and to consider the impact of language, culture and gender on the assessment process.[21] Low levels of cultural understanding among staff can lead to discriminatory experiences which can reduce trust and lead to future reluctance to use services.[14, 16, 25]

People from minority ethnic groups who have lower levels of acculturation, i.e., shorter residencies, limited language skills and awareness of the different health structures and systems, etc., may also find it more difficult to access healthcare services.[25, 26] Access to appropriate healthcare services may be reduced further by a lack of knowledge of symptoms.[16, 20] Limited understanding of symptoms together with the complexity of a new healthcare system, allied to lack of information about how healthcare works can lead to people using services that are inappropriate to their needs which can lead to increased pressure on prehospital ambulance care.[16, 27]

Language and communication problems are another reason why there is under-use of prehospital ambulance care among some minority ethnic groups. For example, language can be a significant barrier for patients when trying to communicate their symptoms over the telephone to emergency call handlers.[26] Interpreting services are available for ambulance staff but may be inaccessible at certain times and unable to provide necessary languages or dialects.[28] This places a greater reliance on family members to translate, which also has its drawbacks.[28, 29] Language barriers can also lead to miscommunication of diagnosis and treatment resulting in preventable morbidity and mortality.[26, 30]

While previous literature suggests that some ethnic groups are reluctant to seek help for medical conditions, evidence also suggests that they may be taken less seriously by health care professionals, or perceived as inappropriately frequent users of health services. In the UK, GPs sometimes perceive that their South Asian patients to take up more time in the surgery presenting with ‘trivial’ disorders.[31]

The significant proportion of patients for whom ethnicity data was missing also raises issues for ambulance services, especially as they strive towards their statutory equality duties set out in the Equality Act 2010. Paramedics are required to collect ethnicity data from patients, but ambulance services may not record such information accurately or at all. For example, in 2013/14 one ambulance service recorded 47 per cent of patient ethnicity data.[32] There are a number of reasons for the incompleteness and inaccuracy of ethnicity data recording. Given the emergency nature of the situations, paramedics may focus on patients’ clinical conditions rather than recording ethnicity. Paramedics may also feel uncomfortable asking the patient

their ethnicity as they are worried how this question may be perceived by the patient, who may be reluctant to disclose their ethnicity. This problem is heightened by the lack of consistency of ethnicity coding between ambulance services.[6] The incompleteness of ethnicity data is likely to hinder progress towards reducing ethnic health inequalities.[33]

Implications for future practice and research

These findings call for further studies utilising larger and more complete datasets to explore ethnic differences in prehospital ambulance care. Qualitative studies could also be used to explore the experiences of minority ethnic patients with suspected cardiac pain or other conditions where differences in prehospital management are found. A better understanding of the cultural factors affecting expression and choice of treatment could improve the quality and equity of prehospital ambulance care for minority ethnic patients suffering from suspected cardiac pain or other conditions.

Strengths and weaknesses

Our analysis showed significant differences for ethnic groups in the way that some aspects of prehospital ambulance care were delivered to patients with suspected cardiac pain. Although we used a large dataset, almost one-third of patients had missing ethnicity data. This could be due to language barriers, time constraints, patient reluctance to disclose ethnicity, as well as paramedics prioritising the improvement of clinical conditions rather than ethnicity data recording. The missing ethnicity data may have been a source of bias and led to over- or under-estimation of the differences by ethnicity. The low numbers of minority ethnic patients also prevented ethnic group analysis which limits the extent to which our findings can be

generalised. Also, variation in diagnostic codes used by paramedics could have led to differences by ethnicity.

CONCLUSION

This is the first study showing differences in prehospital ambulance care for people with suspected cardiac pain according to ethnic status. The ethnic differences in the treatment of suspected cardiac pain could be due to recording bias, differences in the clinical conditions presented or real disparities in clinical management. Ethnic differences in treatment for suspected cardiac pain may also arise through cultural differences, discriminatory experiences, language and communication problems, as well as a limited patient awareness of symptoms and how to use healthcare services appropriately. There may also be issues about local variations in ethnic classifications, which may lead to paramedics being unsure of how to record patient ethnicity data. When attending emergency situations, paramedics may not prioritise the recording of patient ethnicity data as their primary focus will often be on trying to improve the patient's clinical condition. Such differences merit further quantitative investigation with larger, more complete datasets. If these differences are confirmed, qualitative exploration of reasons why they exist is needed.

ACKNOWLEDGEMENTS

We would like to thank members of the Community and Health Research Unit (CaHRU) study review group for their comments on this paper.

DATA SHARING STATEMENT

No additional data available.

ETHICAL APPROVAL

This study was approved by the Ethics Committee of the University of Lincoln. Approval for Research Management and Governance was sought and gained from East Midlands Ambulance Services NHS Trust.

COMPETING INTERESTS

None.

FUNDING

The study was supported by East Midlands Ambulance Service NHS Trust.

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